

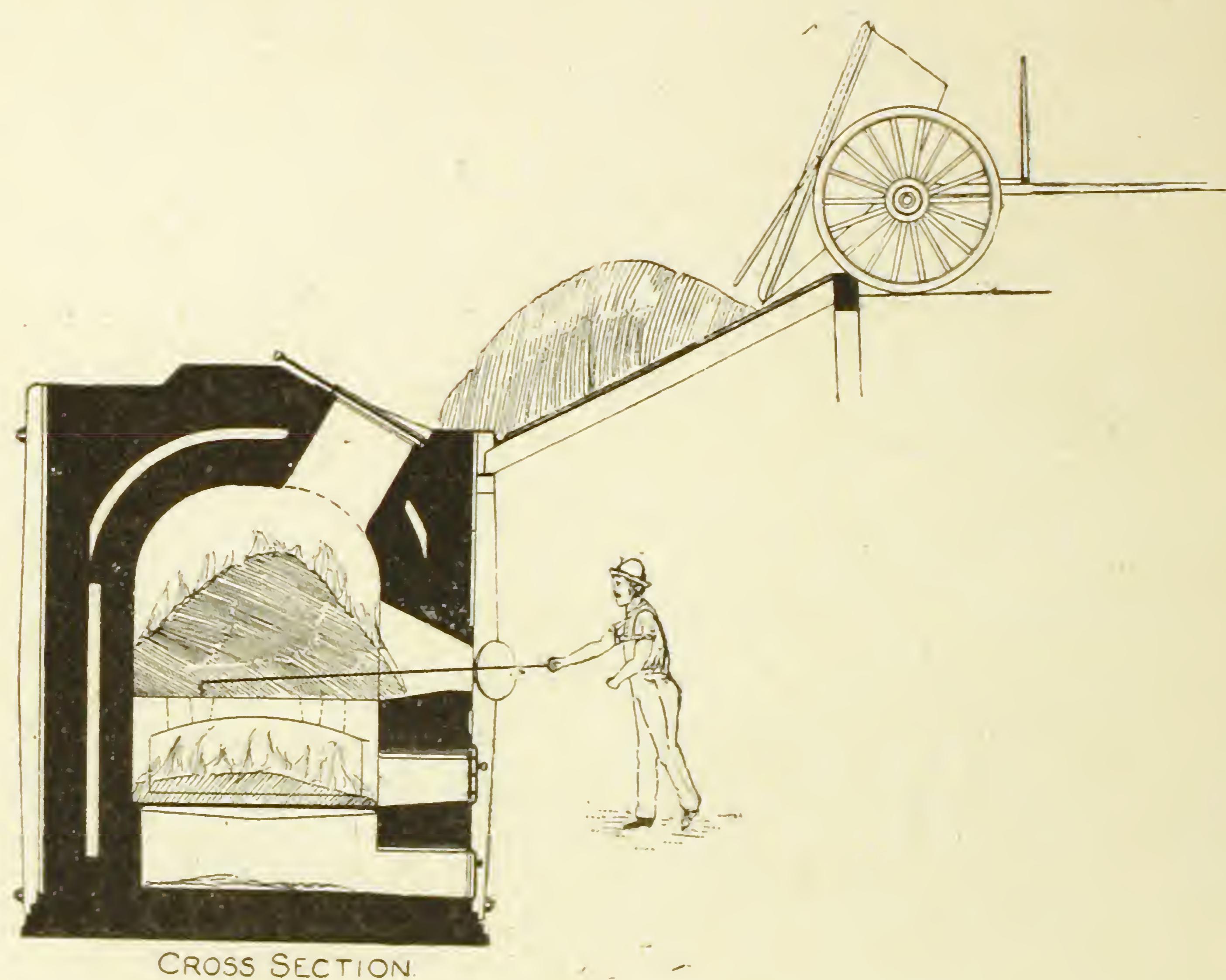
628.3

*Engle*

THE  
**ENGLE SANITARY**  
AND  
**CREMATION COMPANY'S**  
  
**WORLD'S COLUMBIAN**  
**EXPOSITION,**

CHICAGO, ILL.,

U. S. A.



CROSS SECTION.

THE EXHIBIT  
OF THE  
ENGLE SANITARY & CREMATION COMPANY  
AT THE  
WORLD'S COLUMBIAN EXPOSITION,  
CHICAGO, ILL.,

U. S. A.

...⇒A. D. 1893.⇒...

---

THE ENGLE SANITARY  
AND  
CREMATION COMPANY,

JAMES C. SAVERY, President. JAMES CALLANAN, Treasurer.

DES MOINES, IOWA,  
AND  
30 STATE ST., NEW YORK.



THE ENGLE CREMATORS AT THE WORLD'S COLUMBIAN EXPOSITION, CHICAGO.  
(LOCATION IN THE SOUTHEASTERN PART OF THE GROUNDS.)

## THE ENGLE GARBAGE CREMATORS

EMPLOYED AT  
THE WORLD'S COLUMBIAN EXPOSITION.

When the plans for the World's Columbian Exposition at Chicago were made, and it was found that nearly 600 acres of ground were to be occupied with buildings that would be thronged with multitudes of people for six months of the summer season, it became apparent that one of the most serious questions before the Administration was that of sanitation.

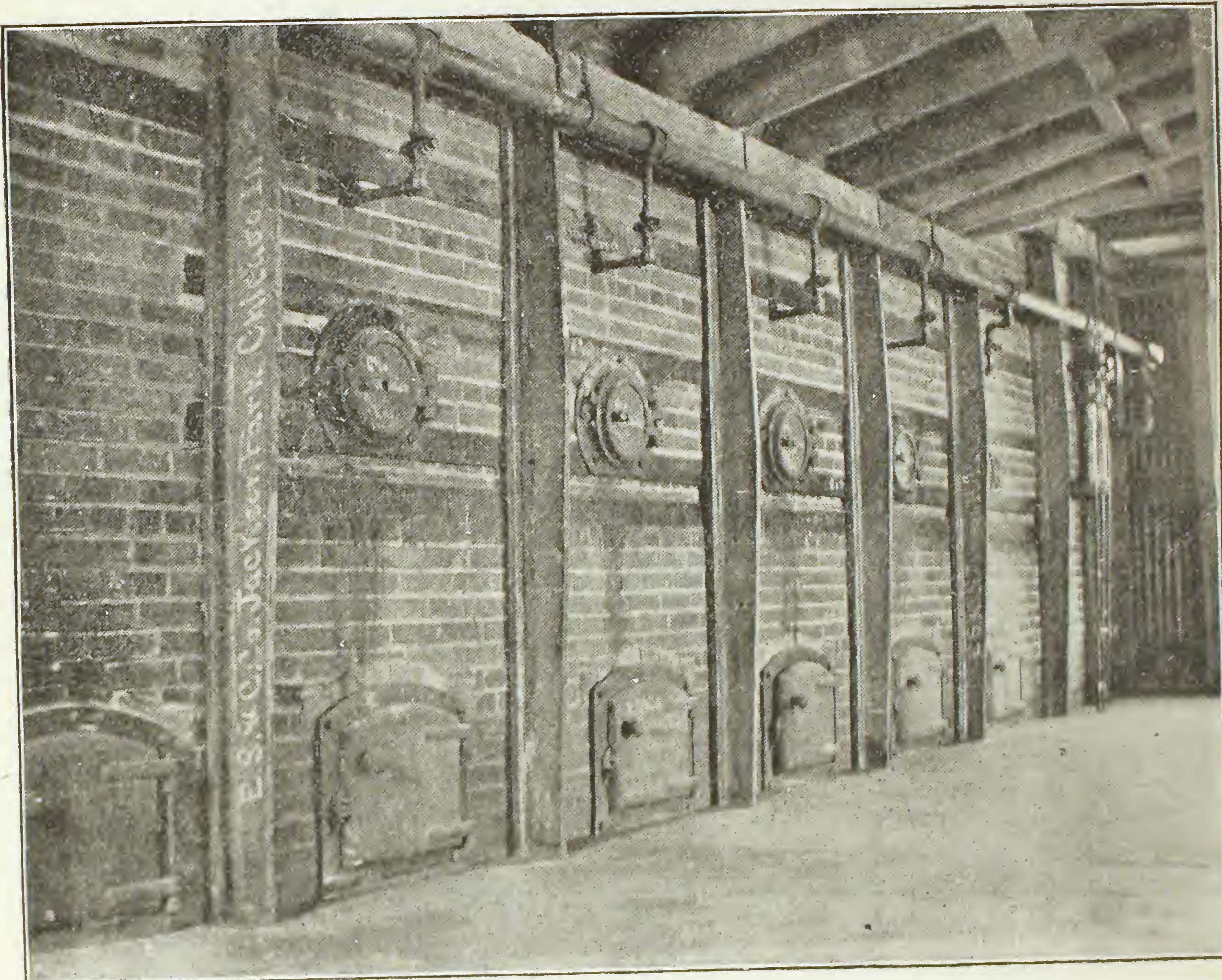
For, the situation to be met was that of a concourse of strangers amounting practically to an improvised city or encampment of at least 80,000 inhabitants; including constant residents to the number of 20,000, and a possible average of ten times that number of visitors every day during the season, besides the extensive "Live-stock Exhibit;" from all which continuous concourse of men and animals, the excreta, refuse and garbage of every kind resulting from their presence and sustenance on the grounds must be daily received and disposed of entirely within the crowded space of the Fair, there being no legitimate outlet on land or water, nor any aid to be obtained from the city for such purpose.

Probably there has never been, in the history of municipal sanitation, a more difficult problem, or one more absolutely requiring an effectual scientific solution, than this. The prompt and unerring solution of this problem, realizing the very ideal of success, to the admiration of every visitor who inspects the processes or notices the perfection of their results, reflects great credit upon the ability and good judgment of Mr. W. S. McHarg, of Chicago, the Sanitary Engineer of the Exposition, having charge of the Water Supply, Sewerage and Fire-protection, as well as upon the energy and liberality of the general constructive management.

That solution is expressed in the one word, "Fire!"—the last word, and likely to remain the last word, among all methods for cleansing cities and human habitations of their polluting and disease-breeding waste. As definitely, too, the scientific principle of duplex combustion, perfect and irresistible, was recognized in the Engle Cremator, as confirmed by the uniform experience of cities and by an exhaustive and impartial comparison, on the part of Engineer McHarg, of all the various systems of garbage disposal in this country and abroad.

Accordingly, a contract was made with the Engle Sanitary and Cremation Company, of Des Moines and New York, for the erection of two Garbage Cremators guaranteed to destroy utterly 100 tons per day of garbage, miscellaneous combustible waste, sewage sludge, and stable refuse. At the same time the "Shone Hydro-pneumatic System of Sewerage" was adopted, and in due time installed in connection with all the larger buildings of the Exposition, to convey the sewage from the closets and drains, and to deliver it, in the form of compressed precipitate, to the cremators.

The furnaces cover a space of ground, including the chimney, 42 feet long by 18 feet wide. There are two furnaces placed back to back, with a brick stack of 50 feet high common to both. They are surrounded by platforms with inclined approaches, which allow the collection carts to discharge their loads directly upon iron slopes leading down to the feeding holes of the furnaces. The furnaces and the slopes are covered by a protecting house 45 feet square, of corrugated iron, with large doors on each side admitting the collection carts for the deposit of garbage. All of the waste collected is discharged inside this covering-house. There are four feeding holes for each



THE WORKING SIDE OF CREMATORS WITH STOKE ASH PIT DOORS.

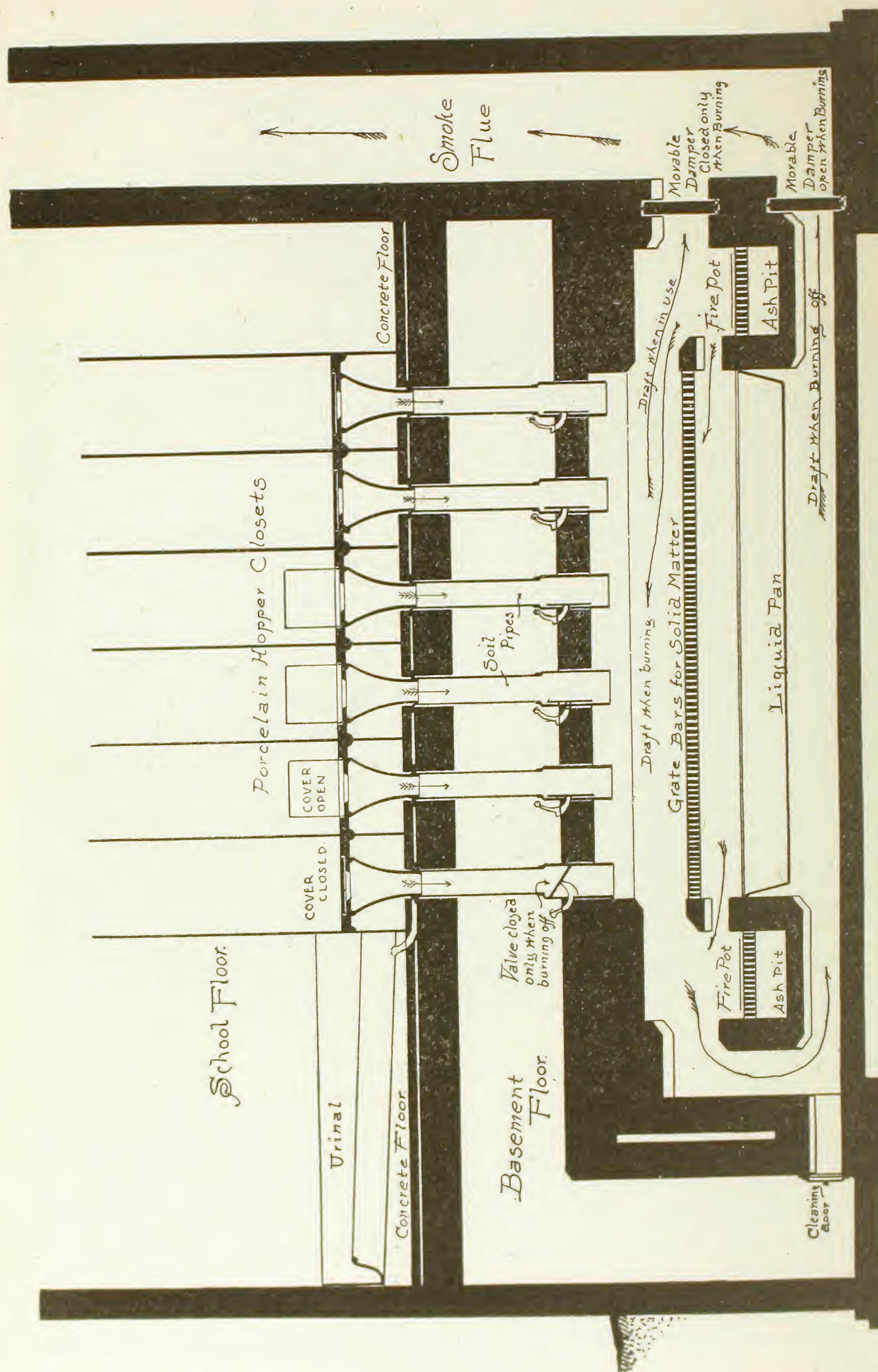
furnace, connecting at the bottom of the iron slopes, through which the garbage is discharged into the interior of the furnaces. The capacity of the slopes is twenty tons, which is equal to the capacity of each furnace for one charge. The garbage is received inside the furnaces on grates made of interlocked fire-clay brick, through the spaces of which the ashes pass into the lower chamber.

The fuel (as required to be used on the Exposition grounds) is crude petroleum oil, which is conveyed through three burners, two of which (for the initial fire) are placed at the rear or stack end of the furnace, and one (for the secondary or perfecting fire) at the front extremity. The form of

hydro-carbon burner adopted is the "S. C. T. Burner," largely used by the Standard Oil Co. for the production of high temperatures at their pumping stations. Air for atomizing the oil is driven from a Root Positive Blower by an electric motor of twelve Kilo-watt power. The pressure of only eight ounces of air to the square inch furnishes the best result for the combustion of the oil. The flame from the rear or initial burners passes over and through the garbage, swiftly licking up its moisture and volatilizing and inflaming its combustible elements. This blazing mixture of gases, vapor and smoke then enters the flame of the second burner at the other extremity of the chamber, turning downward into a return flue beneath the grating, through which the whole product, in a state of perfected combustion, is driven back to the smoke stack, filling the space beneath the grating and the entire mass of garbage upon it with all-consuming heat. Every particle of the vapors, smoke and gases is annihilated before reaching the outlet, and issues only in an aerial residuum, thin, colorless, odorless and innoxious as the atmosphere itself, in which it is dissipated unperceived. This operation is maintained continuously without limit of time, the charging and removal of ashes being carried on without interference with the work of combustion.

In the earlier weeks of the Fair, the daily collection of waste was about fifteen tons, which was destroyed by one furnace in about six hours time, using only about one-third of the capacity of one furnace, and that for about one-fourth of each day, although the sewage-sludge and garbage often contain twenty to fifty per cent. of liquid, which requires a degree of heat realized from no other principles of combustion to overpower it with the unimpeded swiftness witnessed in the work of the Engle Cremator. When the furnace is first fired, the three burners quickly raise the temperature to a height in which the material to be consumed is compelled largely to sustain its own combustion, aided only thereafter by two burners with the smallest amount of oil which can be used. The labor employed is that of three men running the furnaces, while others subsequently remove the ashes.

The location of the Engle Cremators is in the extreme south-east part of the Exposition grounds, within one hundred yards of the power-house of the Intramural Railroad; within one hundred and fifty yards of the Forestry Exhibit, and one hundred and twenty yards from the Sewage Cleansing Works. Thus to destroy dangerous and offensive waste in great quantities, in the immediate neighborhood of the buildings of the Exposition, under the noses of multitudes of people, under the critical observation of sanitary officials, engineers and experts perfectly familiar with all forms of furnaces and modes of combustion, and to perform this work in a manner universally satisfactory and beyond criticism, entirely sanitary, speedy, economical, thorough and pleasant: is, undoubtedly, the most exacting test and the most conclusive demonstration of the supreme advantage and utility of the destruction of waste by fire that has ever been seen in this or any other country.



SIDE VIEW OF INTERIOR OF SCHOOL FIRE CLOSET.

## THE ENGLE SCHOOL FIRE CLOSET.

This invaluable adjunct for a majority of school and other public buildings throughout the country, is placed simply on exhibition by the "Engle Sanitary & Cremation Company," alongside of the operating Engle Garbage Furnaces, in the southeastern part of the Exposition Grounds.

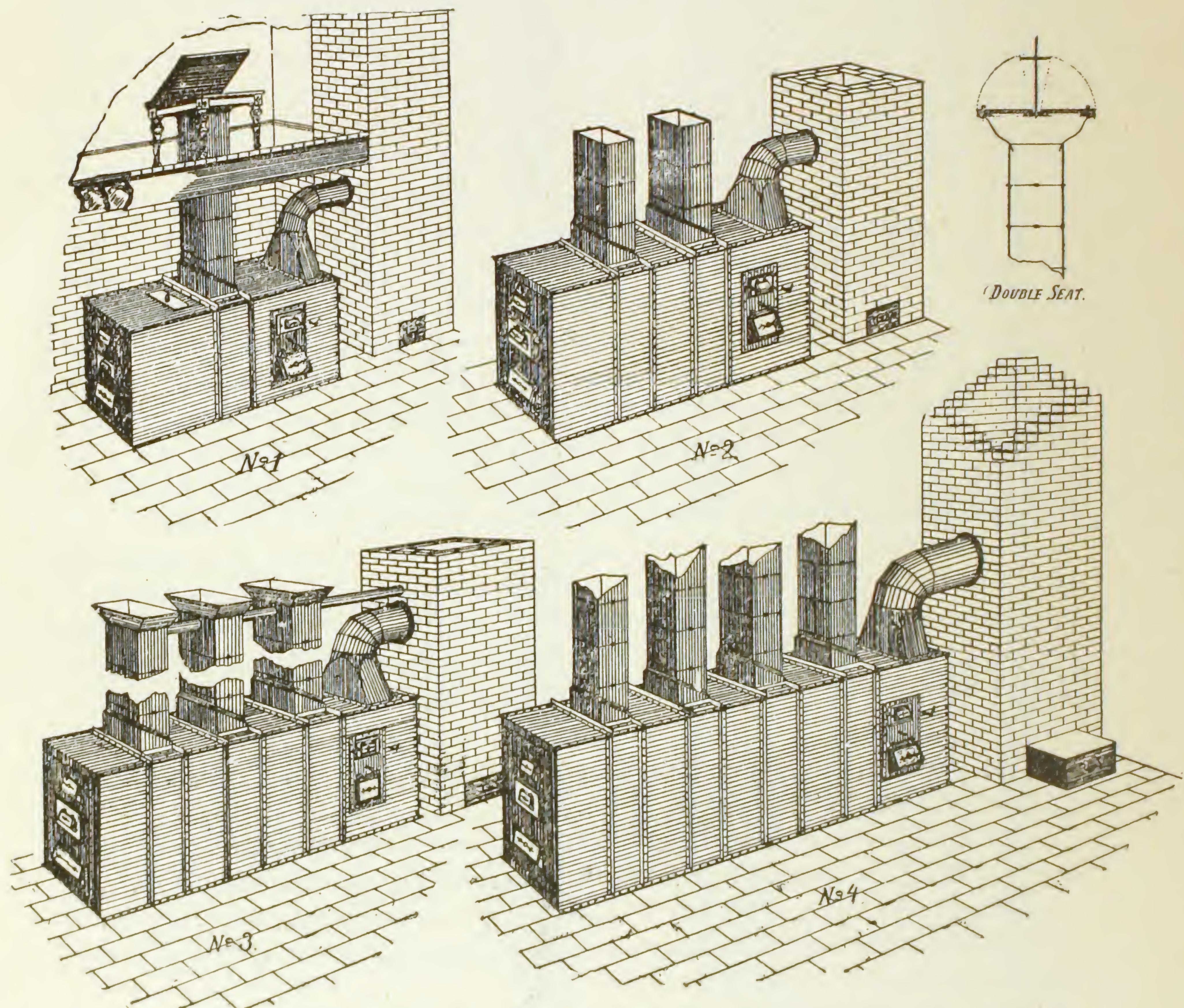
The essential methods of construction and operation shown in this exhibit are the same as in every one of the Engle Furnaces large and small, to wit: the gathering of the material to be destroyed upon the perforated grates; the elimination of liquids in an evaporating pan underneath; the duplication of fires, as already described, the first fire being driven over and through the material to be destroyed and delivering it in flaming gases into a second fire at the opposite end, by which combustion is perfected without noticeable discharge from the chimney. The upper part of the closet is arranged for the seats and soil pipes to be connected with it, such as would be usually found in the toilet rooms of school buildings. As the interior of the fire closet connects with the chimney, there is always a draft of air into the stack or chimney, carrying away all odors. The application of fire is imperatively when the accumulations have reached a point equal to the capacity of the evaporating pans. Under ordinary conditions the use of a small amount of coal or other fuel twice a month is sufficient to destroy all the matters accumulated in the interior. The time required is usually about two hours, and no change in the apparatus is needed except the pushing in of two or three valves or dampers. There is no connection with the ventilating system of the room. It may be entirely isolated from the main building by being placed in a small annex, or it may be constructed in the basement, using a comparatively small space.

Dr. KENNEDY, Secretary State Board of Health, Iowa, says in the Monthly Bulletin for Oct. 1892 :

"We believe this crematory, or one doing similar good service, should be in every state building and private or public school building in the State.

"It is admirably adapted to hotels, court houses, etc., and they have been put in several private houses in this city at trifling expense, and at immense satisfaction to their owners.

"We believe the cremation of garbage and night-soil the only sensible and sanitary way of disposing of such refuse. It is not only the safest, but the most economical. The correctness as well as the importance of this method of the disposal of garbage and of human and other animal excreta is rapidly being acknowledged and we predict that the day is not far distant when our present barbaric and primitive methods will be exceptional and not general. For the last few years the question of cremation has only been one of practicability and not desirability. Now that the means of such disposal have been devised, the responsibility of their adoption rests with those whom the State has made the guardians of the public health."



FIRE CLOSETS OF DIFFERENT SIZES FOR USE OF DWELLINGS AND HOTELS.

## THE ENGLE HOUSE FIRE CLOSET.

IN THE ANTHROPOLOGICAL BUILDING, SECTION ..... No. .....

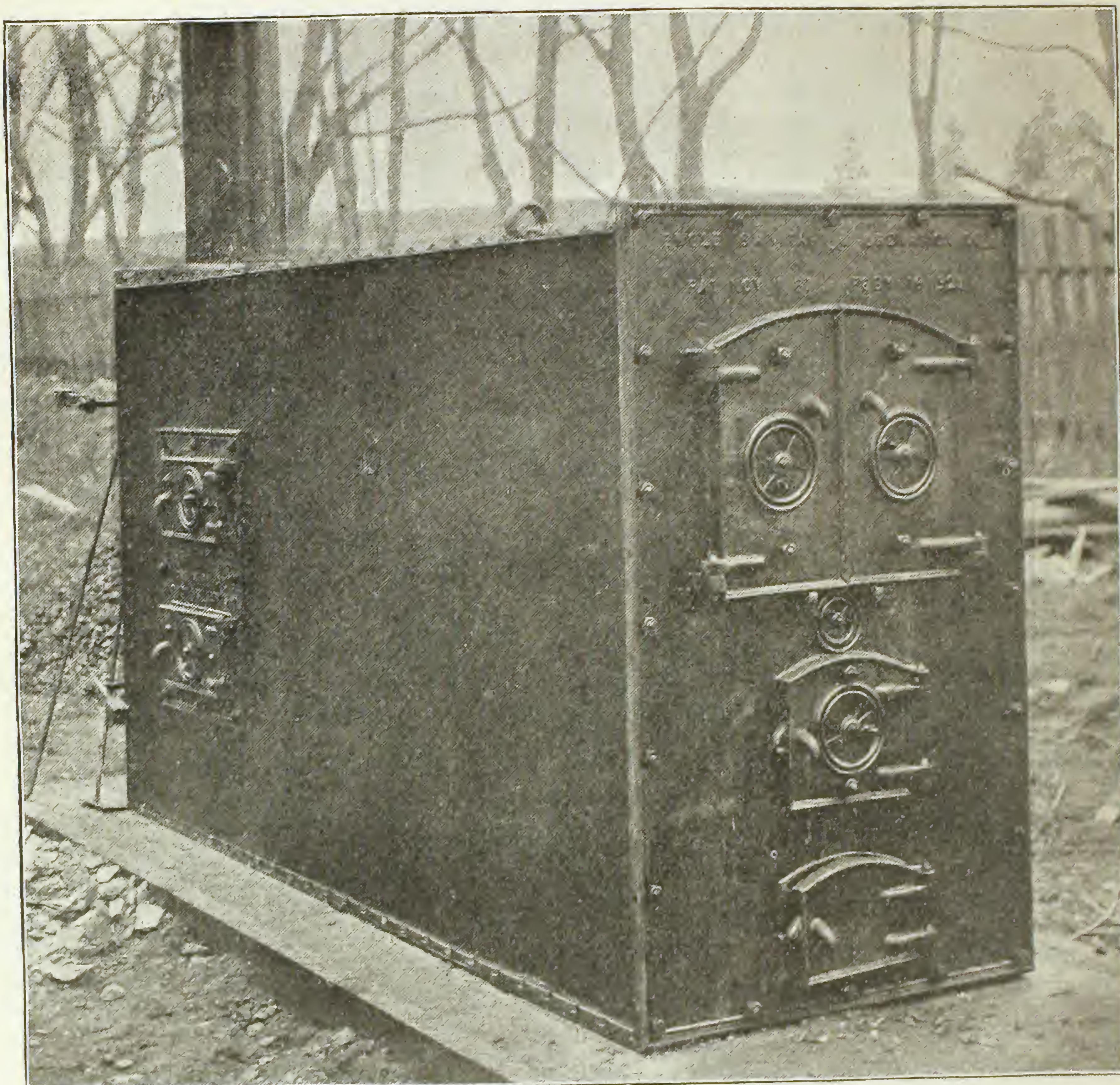
The Engle Sanitary & Cremation Co., exhibit an Engle Sanitary Fire Closet for household use. It is a portable furnace made to receive from the toilet rooms, &c., the household waste, and perfectly consume it without smoke, odors, or fumes. The same methods are employed as in the other Engle Furnaces, for the combustion of offensive material on the grates and in the receiving pans, and the completed destruction, by supplementary fire, of the volatile products arising from the burned material.

The special purpose of this closet is to provide a decent and sanitary substitute in households and other places, for the abominable system of privy vaults, and where earth closets are objectionable;—occupying a small space, using the common house chimney, and easily adapted to all ordinary conditions of the home.

The Fire Closet is constructed of sheet steel, securely bolted together, strongly bound at the angles, lined throughout with indestructible fire-clay blocks, provided with an evaporating pan of a sufficient size, and furnished with the necessary seats and pipe connections to fit any given height or position. The usual location is in the basement or cellar of the house, where the smoke pipe can connect with the chimney, but it can be equally well placed in an isolated building or outhouse, by carrying up a small chimney or smoke pipe. The fuel employed may be wood, coal or coke; the quantity required being very small. The usual time for firing is every two weeks, and it may be done by any inexperienced person who can understand the operation of a range.

These Closets are used in many Private Buildings, and are highly recommended by Health Officials and Sanitarians who have examined their operation. Factories and shops have used them with entire satisfaction. For Hotels and isolated buildings of every kind, where no sewerage is obtainable, they are indispensable and always satisfactory. The cost of fuel to destroy the contents is insignificant and far less than the cost of any system of water carriage.

Pamphlets giving full details will be sent on addressing the Company.



HOSPITAL FURNACE.

## THE ENGLE HOSPITAL FURNACE.

To check the ravages of contagious disease, it is indispensable that Boards of Health and Hospitals be provided with special apparatus capable of destroying all articles that have been connected with any case of the kind, so quickly, closely, and completely, that no germs of the contagion can escape. As to this, all physicians and sanitarians are agreed, and the possible approach of cholera has excited universal interest in objects of this nature. In every direction hospitals are being prepared and cremating and disinfecting machines procured, for a possible campaign against the threatened epidemic. The cuts on pages 10 and 13 show the latest form of the Engle inventions for destroying infected matter with no danger of escape of contagion. The Hospital Furnace is a steel case 8 feet long, 4 feet high, and  $2\frac{1}{2}$  feet wide, lined throughout with heavy fire-brick, provided with the fire grates and receiving pan found in all Engle Furnaces, and with the additional feature of large doors admitting bulky articles, such as bedding, clothing, furniture, &c. Provision is also made for destroying organic waste as well as garbage, bandages, dressings, and all other refuse collected in the hospital. For the destruction of the regular miscellaneous waste this furnace is almost indispensable; and when required to annihilate contagious matter, such apparatus is an absolute necessity. For medical schools also, where necessity often compels a prompt disposal of offensive substances, there can be no apparatus so beneficial as this, and the testimonies from all hospitals and schools where the furnaces are in use are strongly commendatory. The Board of Health of the City of New York have employed a large furnace of this kind for four years past, and the great amount of infected material destroyed therein is a sure proof of its usefulness. These furnaces are portable, are adapted for any fuel; occupy 10 feet by 4 feet of ground; can connect with any chimney of an area of ten inches; are moderate in cost; and will destroy anything that fire can consume, without fumes, odors, or noticeable smoke.

All details of prices, sizes, and capacity furnished on application to the Engle Company, Des Moines, or N. Y. City.

## THE ENGLE SYSTEM OF GARBAGE CREMATION.

The Engle Company have for six years past constantly advocated the radical destruction of worthless and offensive city waste by fire. They have obtained patents upon inventions designed to destroy this waste without nuisance, at small expense, and with the greatest speed. The Company has built Cremating Furnaces under all the varied conditions which exist in the extremes of climate North and South; has demonstrated the ability of these furnaces to destroy any and every kind of refuse that can be collected from any source; has proven that the most offensive matters can be burned without nuisance or objectionable fumes in the near neighborhood of dwellings; has shown that by destroying refuse at points near to the field of collection, large saving of money and time in transportation can be made; and has compelled public recognition of the fact that it is perfectly safe, practicable, sanitary and economical to destroy city waste and garbage by fire.

The Engle Company has extended its inventions to cover the disposal of organic waste by means of private Cremating Furnaces applied directly to the destruction of the excreta from single buildings of whatever size and character; employing the same principles of construction and operation, which have been invariably and entirely satisfactory, alike in the smallest Fire Closet and in the largest Cremator.

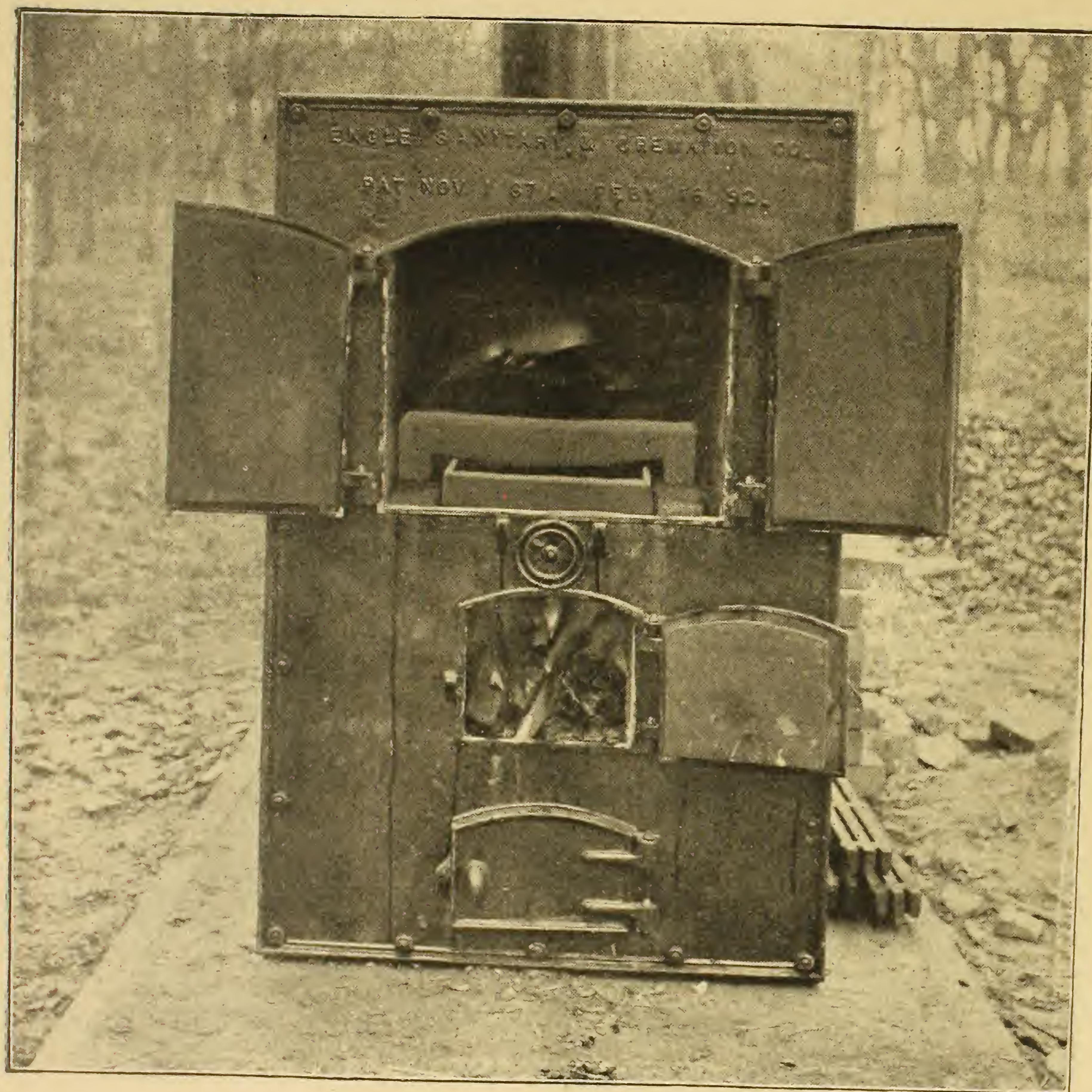
The Company has adopted a policy of business which places these inventions at the service of cities, towns, corporations, and individuals, at a cost exceedingly moderate when compared with other methods of waste disposal; employing any form of fuel best available, WOOD, COAL, COKE, OIL or GAS (natural or artificial) OR ANY COMBINATION OF THESE FUELS, with the same efficient and sanitary results; and guarantee the successful operation of their furnaces, with a durability never yet equalled by any other apparatus of this kind.

The Company invite an examination of their Garbage-Cremating Furnaces, Fire Closets and Hospital Furnaces, as exhibited and operated at the World's Columbian Exposition, and at many cities and towns where in operation, assured that they will be found fully equal in practice to the claims set forth in their behalf.

Address The Engle Sanitary & Cremation Company,

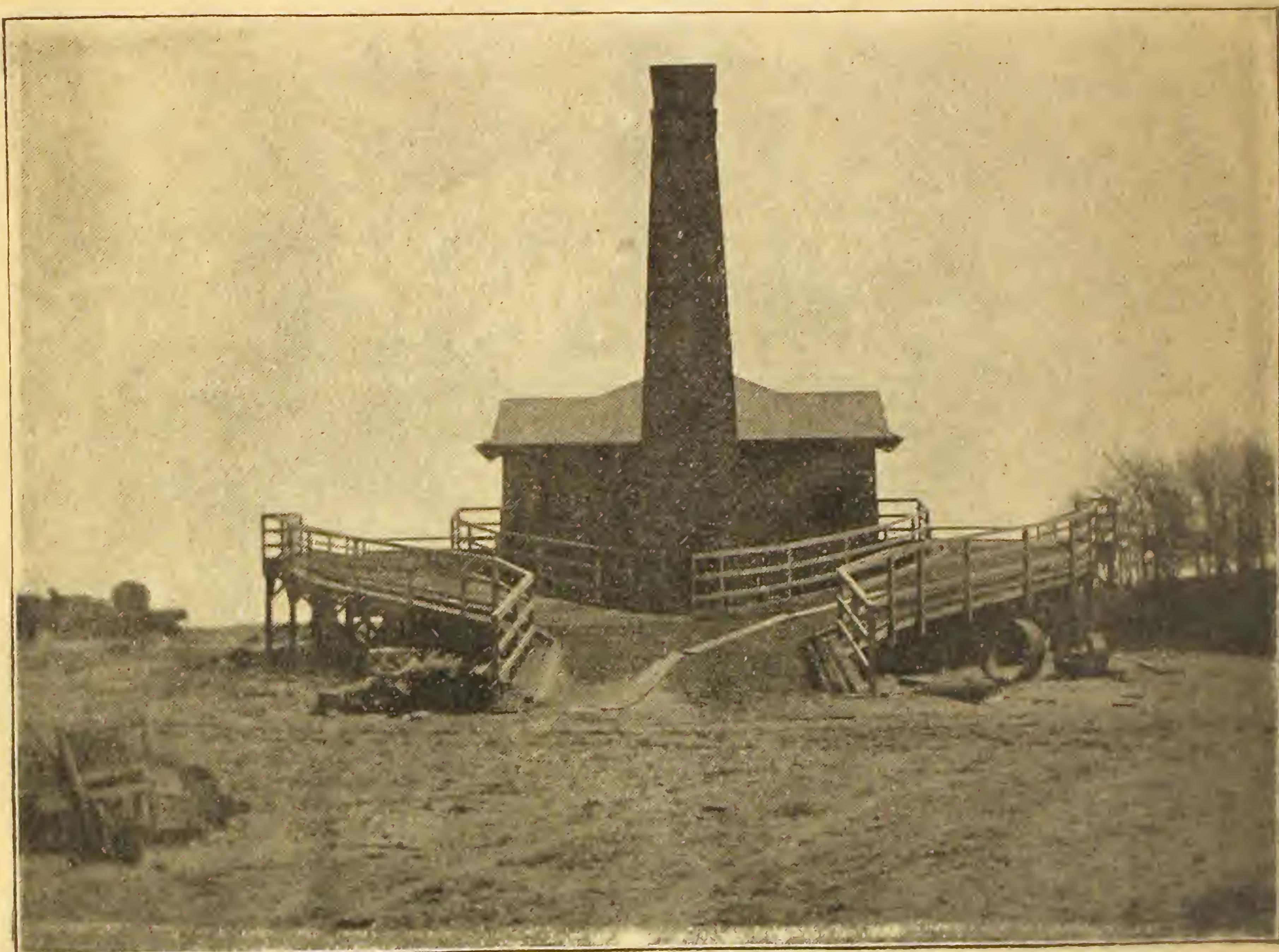
Des Moines, Iowa, and

30 State St., New York City



HOSPITAL FURNACE (Doors Open).

THE ENGLE GARBAGE CREMATORS



AT THE  
WORLD'S COLUMBIAN EXPOSITION,  
CHICAGO, ILL.